

## 6.4 - DAY 2

# Absolute Value Inequalities

Oh, yeah Baby!

$$1. |9x + 1| = 17$$

$$2. -5 + |2x - 2| = 27$$

$$3. |10x - 4| - 9 = 19$$

Just like Absolute Value equations,  
Absolute Value Inequalities will  
ALWAYS have 2 solutions!

You will find yourself working  
with one of 2 types of problems.

1) Less Than/Less Than or Equal  
To

2) Greater Than/Greater Than or  
Equal To

Let's take a look at the difference.

1) Less Than/Less Than or Equal To will result in an AND compound solution.

If  $|ax + b| < c$ , then:

LESS AND

$$ax + b < c \quad \text{AND} \quad ax + b > -c$$

opposite inequality      opposite sign of c

**Example 1:** Reminder to write final answer as an AND compound inequality (with Less Than signs).

$$|x + 6| < 8$$

$$\begin{array}{lcl}
 x + 6 < 8 & \text{AND} & x + 6 > -8 \\
 -6 & & -6 \\
 x < 2 & & x > -14 \\
 \hline
 -14 < x < 2
 \end{array}$$

2) Greater Than/Greater Than or Equal To inequalities will result in an OR compound solution.

GREAT OR

If  $|ax + b| \geq c$ , then:

$$ax + b \geq c \quad \text{OR} \quad ax + b \leq -c$$

↖
↖  
 opposite inequality      opposite sign of c

**Example 2:** Reminder to write final answer as an OR compound inequality.

$$|x - 9| > 1$$

$$x - 9 > 1 \quad \text{OR} \quad x - 9 < -1$$

$$+9 \quad +9 \quad +9 \quad +9$$

$$x > 10 \quad \text{OR} \quad x < 8$$

Example 3:  $|3x - 3| + 4 \geq 10$



Example 4:  $|2x + 5| - 2 \leq 7$

$+2 \quad +2$

$$2x + 5 \leq 9 \quad 2x + 5 \geq -9$$

$-5 \quad -5 \qquad -5 \quad -5$

$$\frac{2x}{2} \leq \frac{4}{2}$$

$$x \leq 2$$

$$\frac{2x}{2} \geq \frac{-14}{2}$$

$$x \geq -7$$

$$-7 \leq x \leq 2$$



Planner Time!